Effects-Based Operations Program

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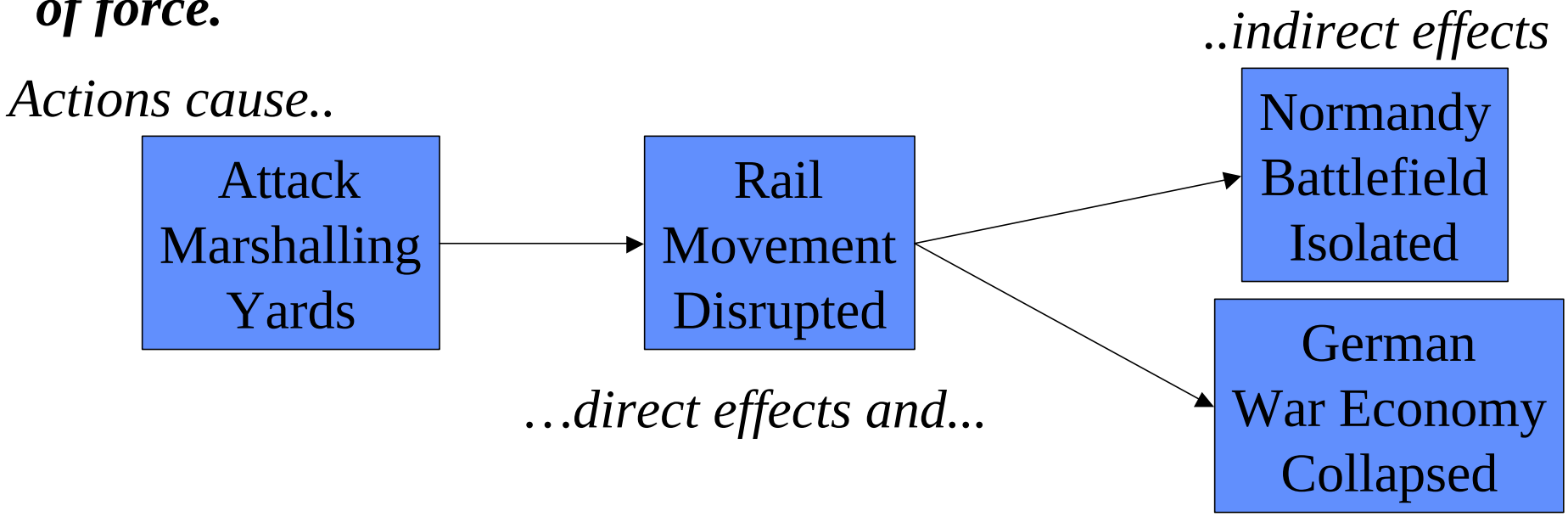
Overview

- What are Effects-Based Operations?
- An EBO model
- EBO Dynamic Tasking Toolkit Vision
- Programmatics
- EBO PRDA Discussion
- Conclusion

Effects-Based Operations

EBO is an approach--a way of thinking--that focuses on effects, not targets, and matches the capabilities of US aerospace power from HMRO to MTW missions, and lethal and nonlethal applications of force.



The challenge is predicting & assessing what physical actions produce the desired behavioral effects

Definitions

- Effects-based vs. objectives-based (Kent) vs. target-based
- No doctrinal template in approved Joint doctrine
  - USAF Doctrine has rudimentary definitions
- Physical => Behavioral
  - destroy (damage), disrupt (Kosovo), degrade, dislocate, decapitate, divert, delay (isolate), deny (halt), deceive, defend, deter (D^{11})
  - coerce: punish, threaten (George, Schelling)
- Historically and theoretically behavioral most important but hardest
  - therefore, traditionally military operations focus on physical effects
- Major problems with behavioral effects:
  - causality between action & effect
  - observability of effect
  - uncertainty of intervening variables

Effect Definitions

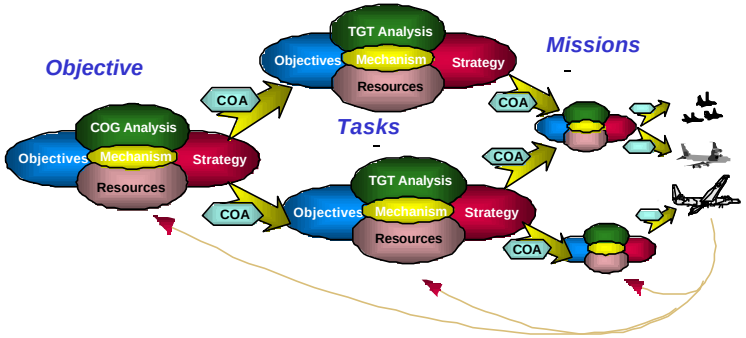
- **Direct Effect (AFDD 2-1): "Result of actions with *no intervening effect or mechanism* between act and outcome. Direct effects are usually immediate and easily recognizable."**
- **Indirect Effect (AFDD 2-1): "Result created through an *intermediate effect or mechanism* to produce the final outcome,which may be physical or psychological in nature. Indirect effects tend to be delayed,and may be difficult to recognize."**
- **Total Effect: All effects acting on a target/set/system/COG**
- **Complex effect: effect resulting from direct + *n*-order effects**
  - "The effects of dislocation, destruction and diversion *create* delays." (AFDD 2, 22, emphasis added);
  - "Through the *combination* of destruction, disruption, diversion, delay, and deception, aerospace power is capable of denying an enemy the ability to offensively employ his forces." (Id)
- **Cascading Effect: effect that ripples through an enemy system, often influencing other systems as well**
  - **Typically the result of influencing nodes that are critical to multiple systems**
  - **Typically flows from higher to lower levels of war**
  - **Vicious & virtuous spirals (Good things could happen or bad things could happen)**

Model

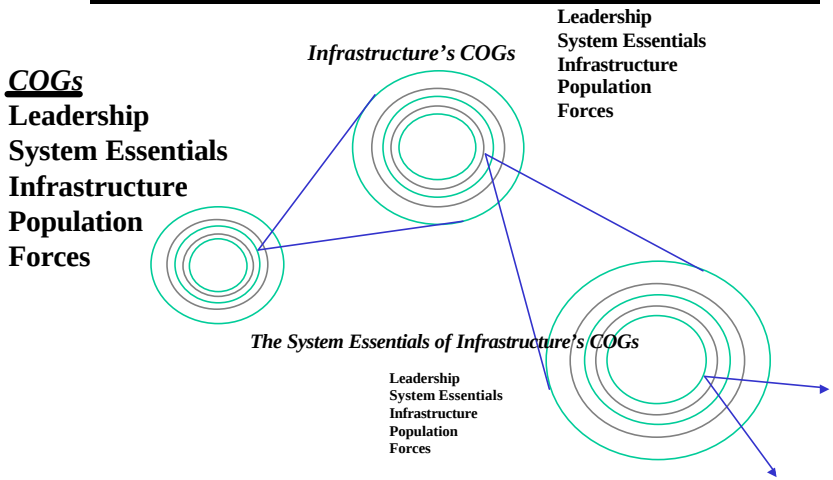
- Assumed that actions cause effects
- One effect can "cause" another effect
  - effects can be intended or unintended
  - unintended effects can be favorable (e.g., Croat/Muslim attack against Krajina Serbs) or unfavorable (collateral damage; Chinese embassy)
- Predicting effects becomes more difficult at higher orders of effect
- Effects have variable persistence but can accumulate
- Culminating point(s):
  - goal: (their) vicious spiral plays out before (your) virtuous spiral does
- Effects are point-of-view dependent

Approach to Modeling EBO

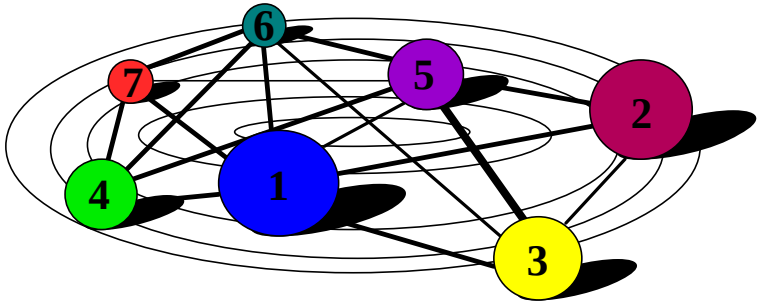
JP 3-56.1 Campaign Planning Model



Warden's "Enemy As A System" Model



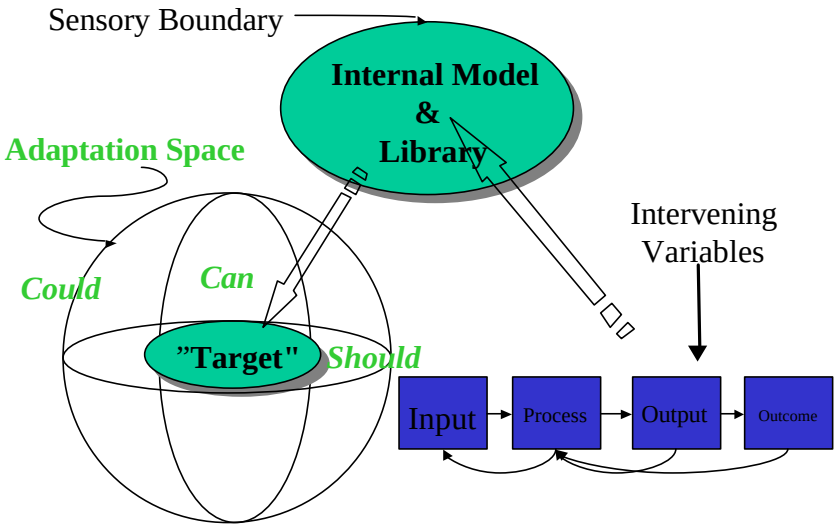
Barlow's "National Elements of Value" Model



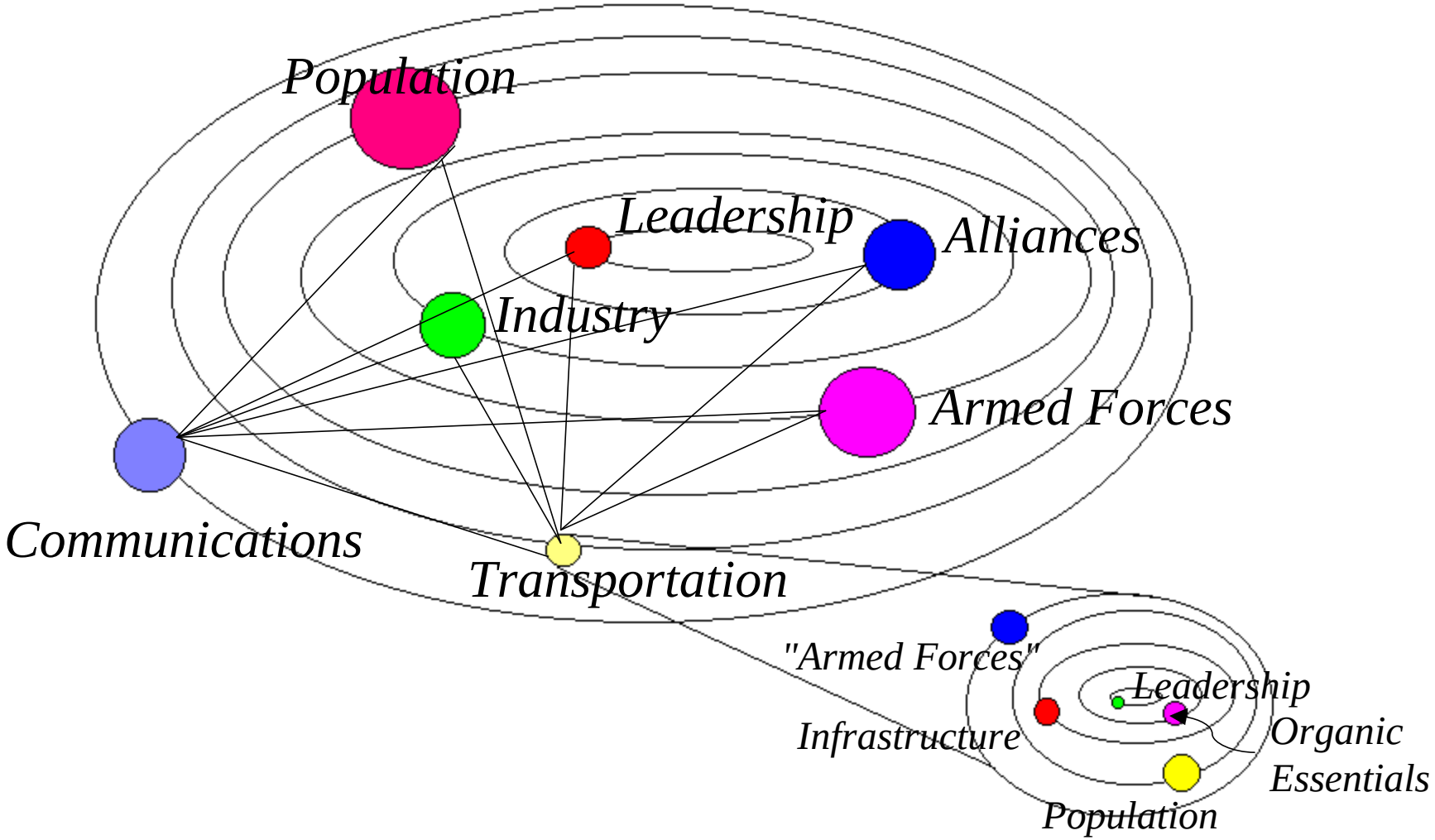
1. Leadership, 2. Industry, 3. Armed Forces, 4. Population, 5. Transportation, 6. Communications, 7. Alliances

Size = Importance of NEV to National Leadership
Thickness = Importance of Connection to other NEV

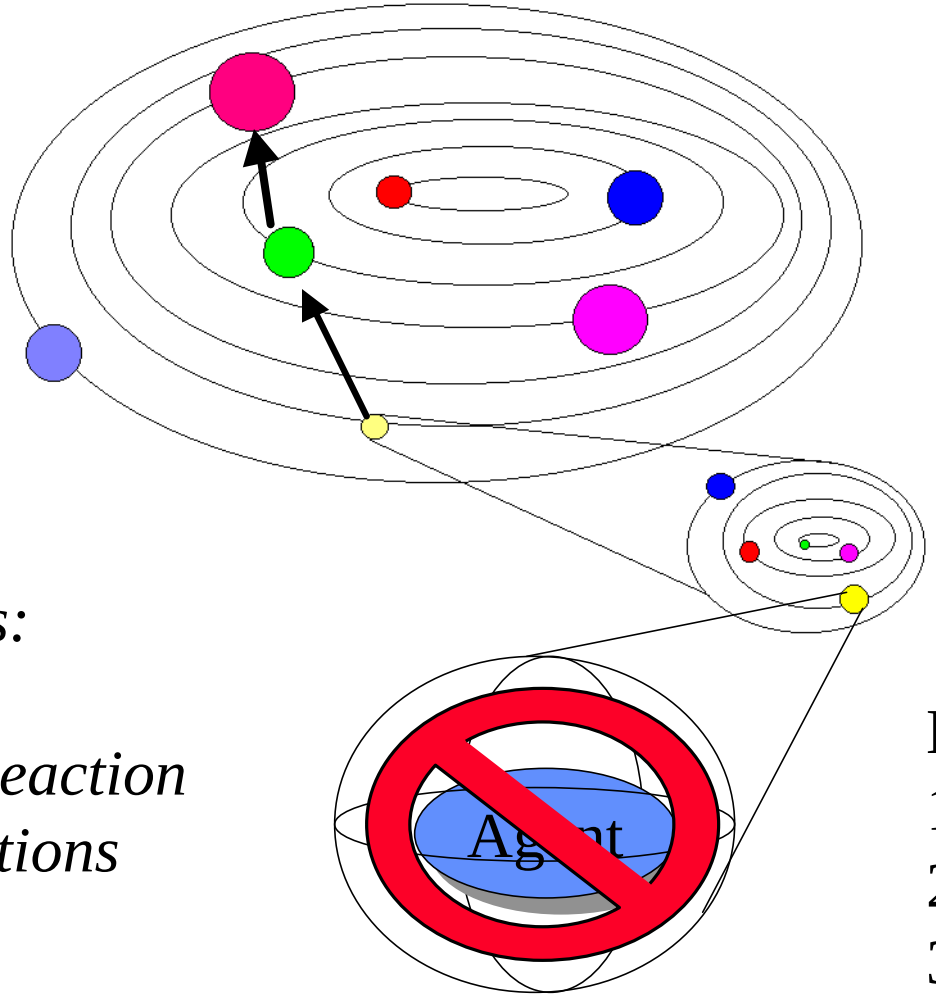
McCrabb's "Enemy Reactions" Model



Warden-Barlow Composite Model



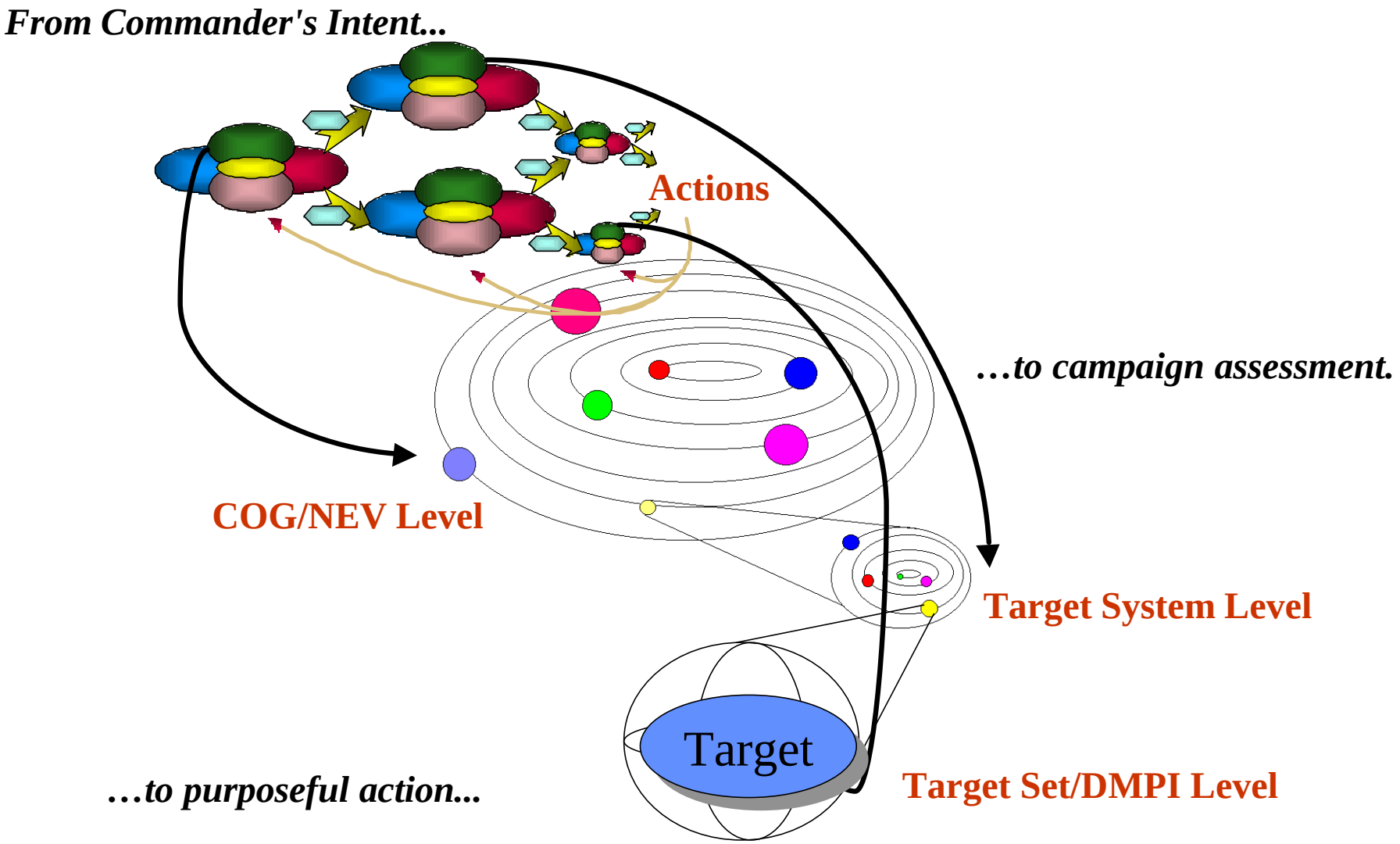
W-B Composite Model with AAS



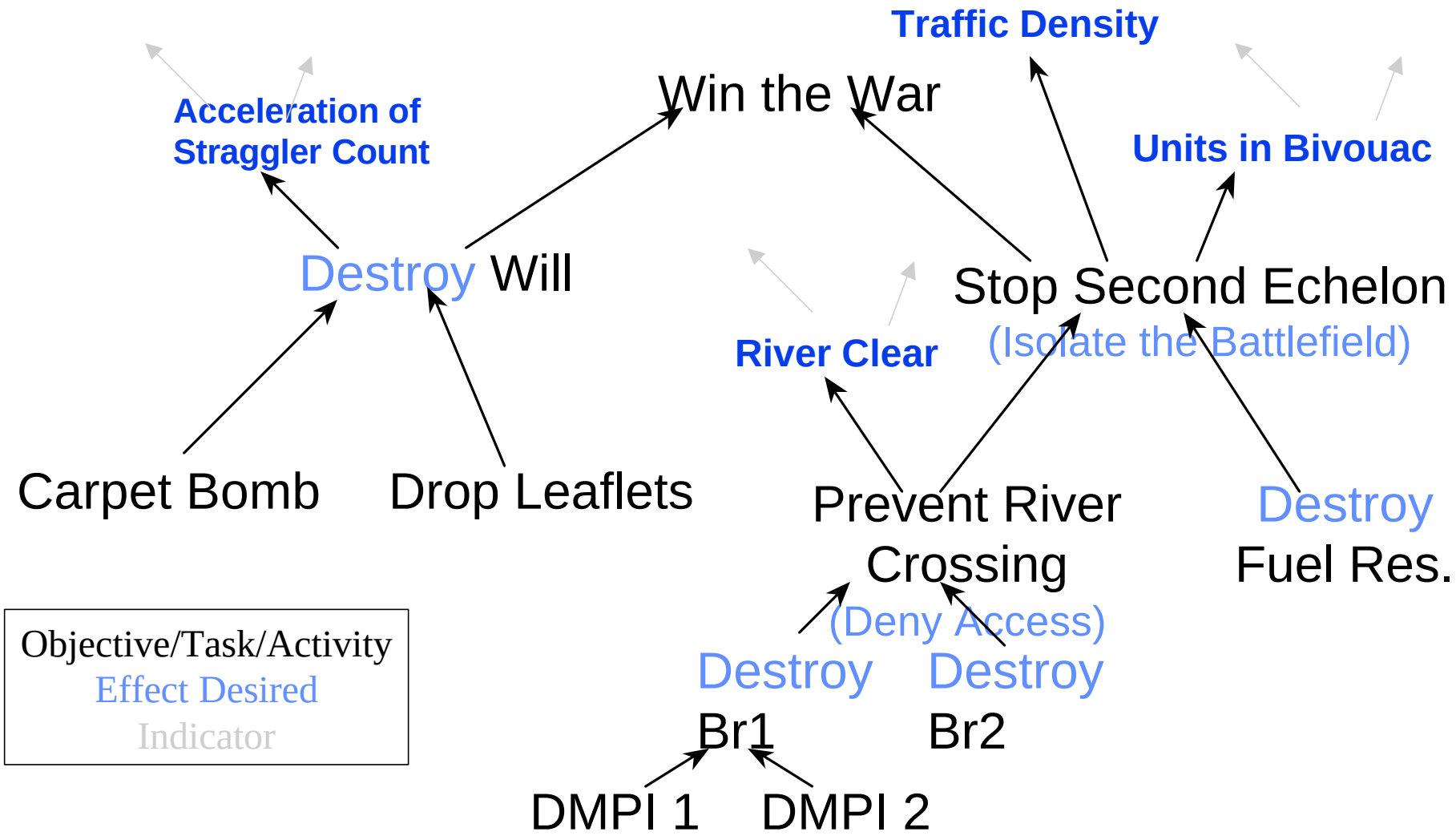
Basic EBO needs:
1. Model Agents
2. Model Agent reaction
3. Model Interactions

Model:
1. Understand
2. Trace
3. Predict

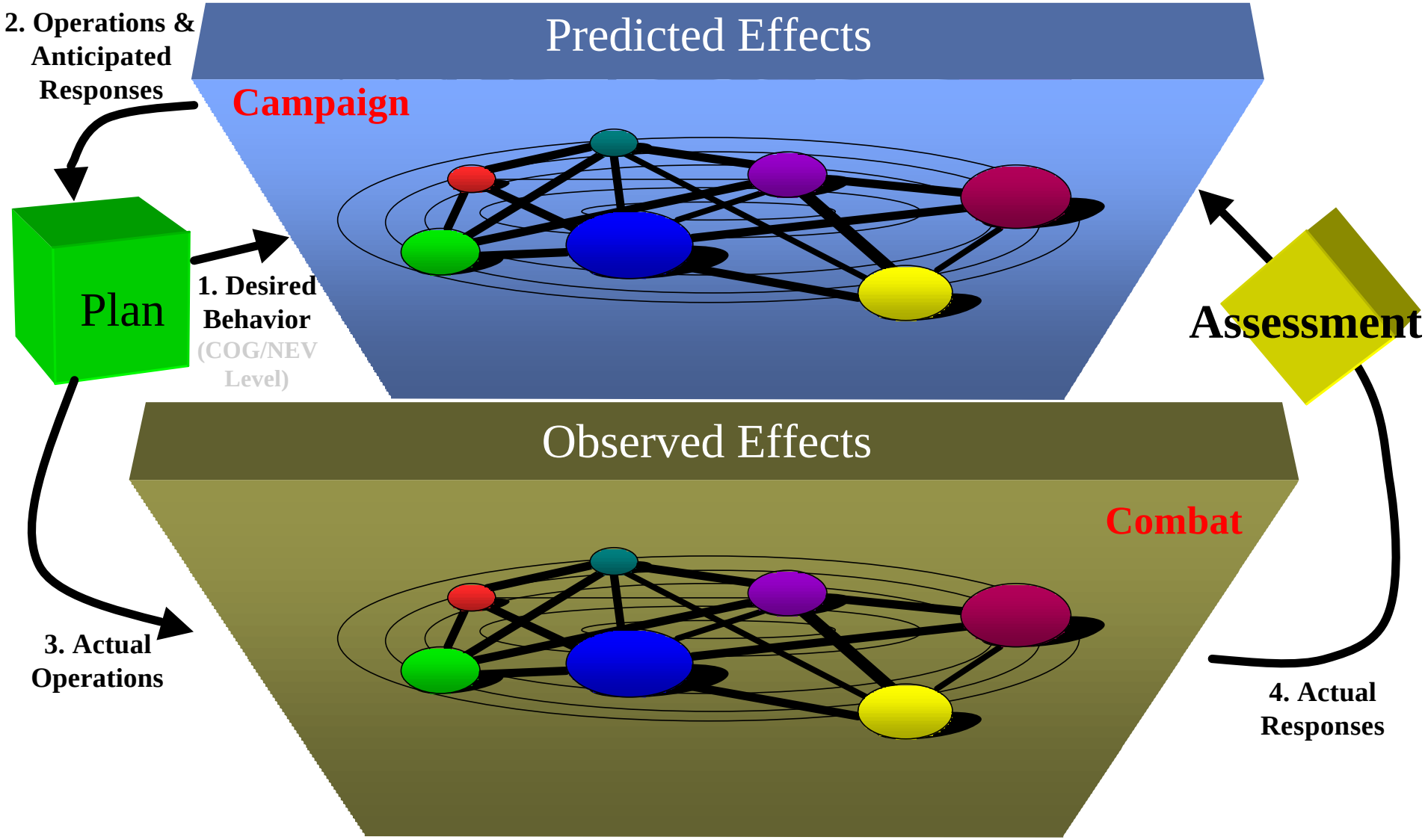
A Composite Model for EBO



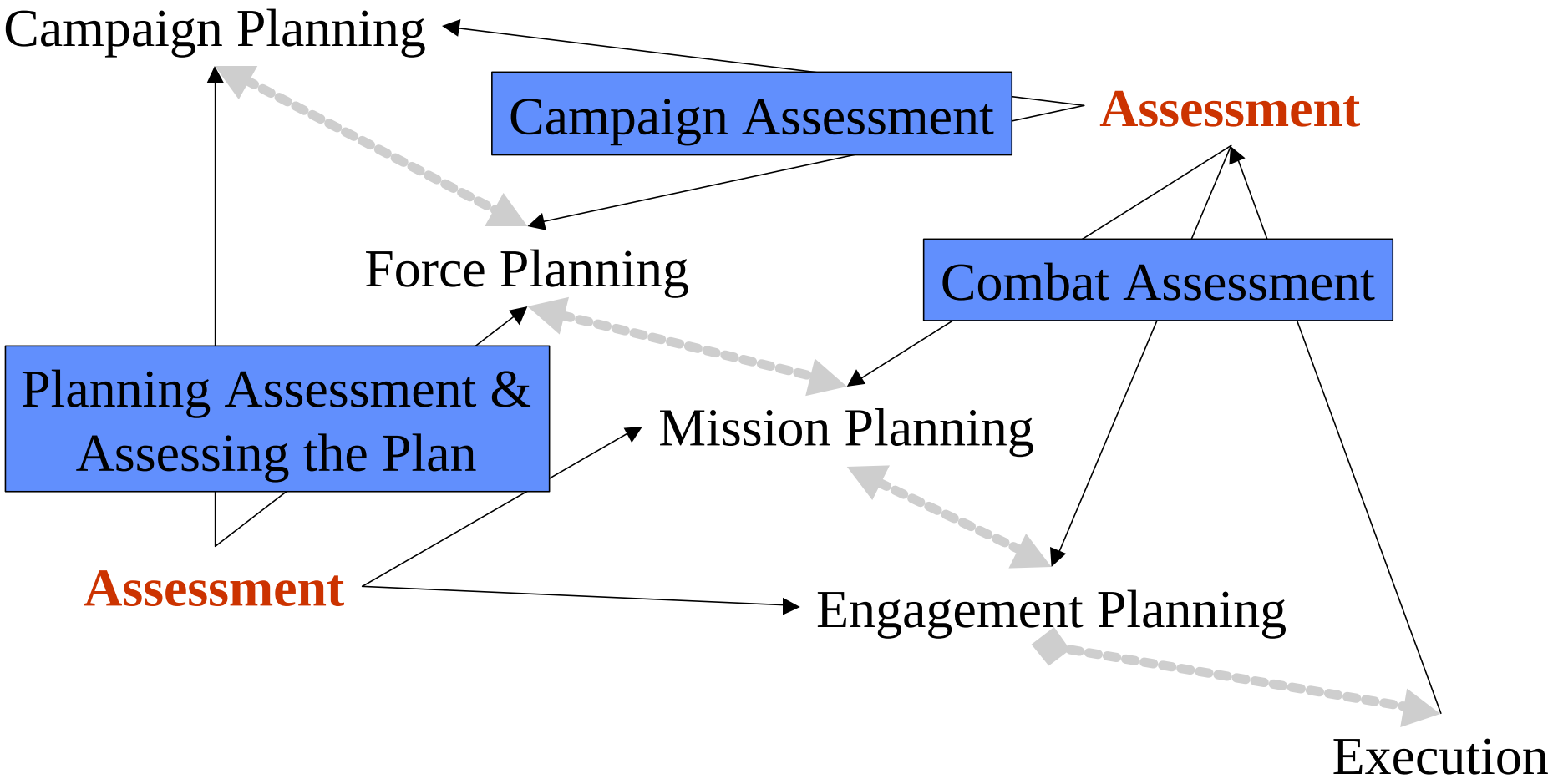
Tasks, Effects & Indicators



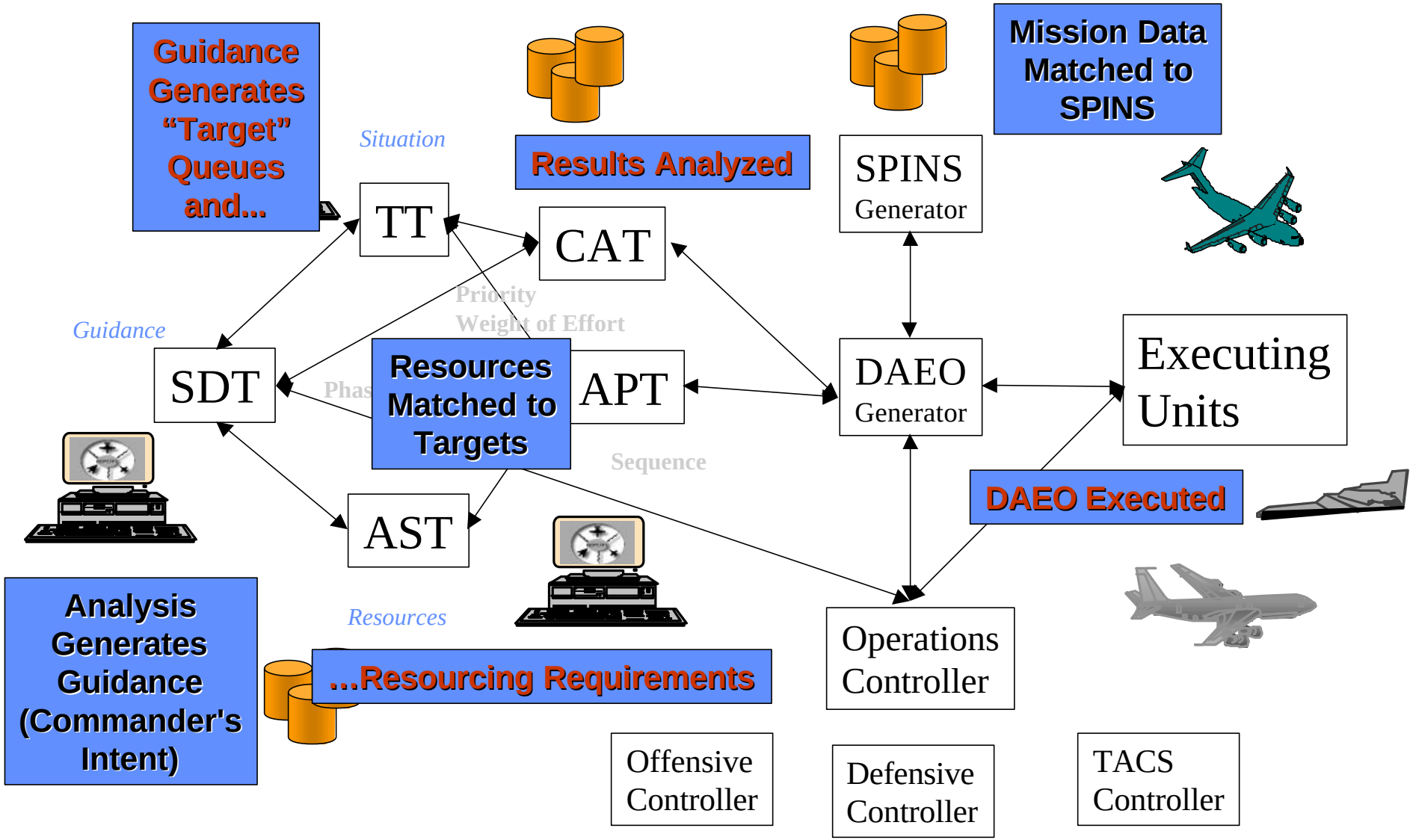
EBO: A Macro Model



Assessment Activities



Vision: Dynamic Tasking Toolkit that supports EBO



Type 1 Technology Proposals

- Address the EBO Operational Framework and/or Technology in support of the EBO Operational CONOPs
- Specific Capabilities of Interest Include"
  - Efficiently Detemining Effects-based Campaign Strategy
  - Improved Planning Leading to more Accurate specification of Logistics Requirements both Physically and Temporally
  - Develop Synchronized Campaign and Combat Assessments for Request for Information
  - Enabling "What If" Analysis of Strategy/Task Options to Optimize Use of Joint Assets
  - Integrate Lethal/Non-lethal Information Operations Methods in to the EBO Framework

Type 1 Technology Proposals

- **Specific Capabilities Continued:**
  - **Focusing/Leveraging Intelligence, Surveillance, and Reconnaissance (ISR) Assets in Campaign Assessment and Planning**
  - **Support Rapid Development of High Quality Target Sets**
  - **Developing Indicators of Battle Damage**
  - **Supporting Re-Targeting in Light of Battle Damage**
  - **Providing Automation Support for Building both Strategy and Assessment Plans**
  - **Supporting Generation of Tasks to Drive the Master Air Attack Plan/Air Tasking Order**
  - **Provide a Continuous Monitoring Capability with Links to Operational Databases**

Type 1 Technology Proposals

- **Specific Capabilities Continued:**
  - **Provide a Drill Down Feature that Allow Rapid Response to General Officer/Decision Maker Questions**
  - **Provide Critical Information for Development of Supporting Plans**
  - **Supporting the Rapid collection/Display of Accurate, Relevant Information for Decision Making**
  - **Integrating Analysis Tools into C2 Systems and the Decision Making Process**
  - **Enabling Predictive C2**
  - **Provide Realistic “Train as you fight” Environment**

Type 1 Technology Proposals Evaluation Criteria

- Overall Scientific and Technical Merit
  - Including Familiarity with Effects Based Operations
  - How Technology Proposed Addresses the Needs of the EBO CONOPs
  - Approach for the Development and/or Enhancement of the Proposed Technology and It's Evaluation
- Related Experience
  - Demonstrate Technology and Domain Knowledge
- Extent to which Existing Capabilities and Standards are Leveraged and Relative Maturity of the Proposed Technology in Terms of Reliability and Robustness
- Reasonableness and Realism of Proposed Costs and Fees (If Applicable)

White Papers

- **Type 1 Technology Proposals:**
  - **Five Copies (5), not to Exceed 15 pages plus a Cover Sheet**
  - **Can Submit more than One (1) White Paper**
  - **Based on Evaluation of White Papers, Selected Offerors will be Invited to Submit Technical and Cost Proposals (Invitation Does Not Assure the Submitting Organization will be Awarded a Contract)**
  - **Instructions for Proposal Preparation will be Forwarded with the Invitation for Proposal Submission**

Type 2 Integration & Assessment Proposals

- Proposals are to Address:
  - Development of a Technical Architecture Framework for Tool Integration
  - The Integration of the EBO Technology Tools
  - The Development of EBO Experiments/Exercises
  - Measurements of the Performance for EBO Dynamic Tasking Toolkit in the Context of the Experiments/Exercises
  - Commitment to Support to Air Force/DoD Sponsored Exercises and Experiments (e.g. JEFX, Blue Flag, etc.)

Type 2 Technology Proposals Evaluation Criteria

- Overall Technical and Management Plan for
  - Developing a Technical Architecture Framework for Tool Integration
  - Integrating the EBO Type 1 Technology Tools and Technologies
  - Developing Experiments/Exercise
  - Assessing EBO Dynamic Tasking Toolkit in the Context of the Experiments/Exercises
- Offeror's Demonstrated Capability to Successfully Integrate Various Technologies and Conduct Experiments
- Reasonableness and Realism of Proposed Costs and Fees (If Applicable)

White Papers

- Type 2 Integration & Assessment Proposals
  - Five Copies (5), not to Exceed 15 pages plus a Cover Sheet
  - Offerors Submitting Type 2 Proposals are Prohibited from Submitting Type 1 Proposals
  - Only 1 Type 2 Award for this PRDA
  - Based on Evaluation of White Papers, Selected Offerors will be Invited to Submit Technical, Cost Proposals and Give an Oral Presentation (Invitation Does Not Assure the Submitting Organization will be Awarded a Contract)

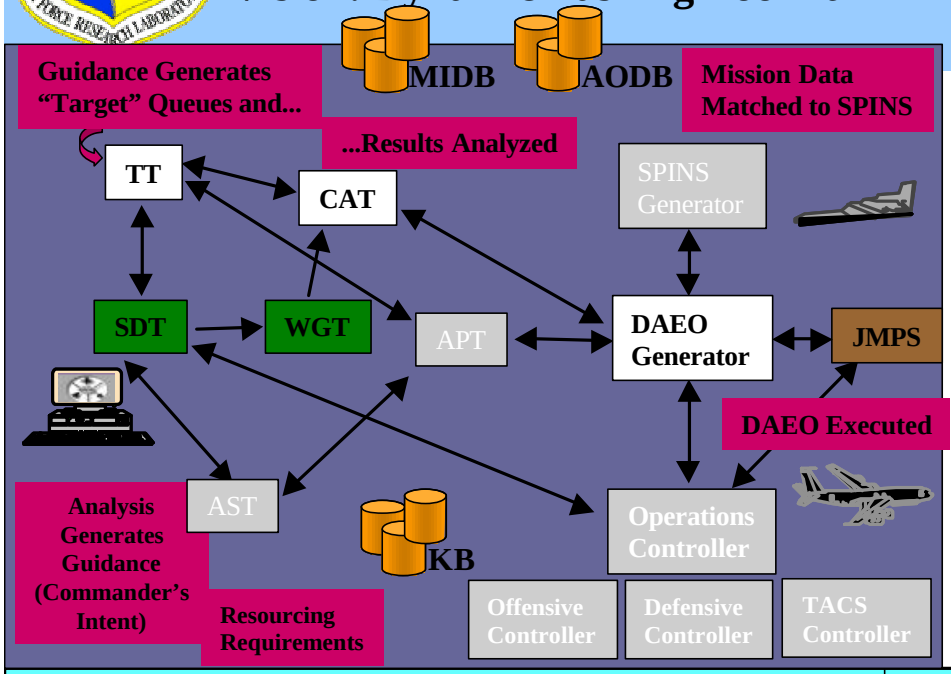
Type 2 Technology Proposals
Oral Presentations

1) Problem Understanding - W
2) Technical Approach (including integration and experimentation)- O
3) Technical Discussion - O
4) Risk Analysis and Alternatives - O
5) Other Technical Factors - O
6) Capabilities and Relevant Experience - O
7) Previous or Current Relevant Independent Research and Development Work - W
8) Related Gov't Contracts - W
9) Facilities/Resources -W
10) Project Organization Team - O
11) Organization Chart(s) with key personnel -O
12) Management and Technical Team - O
13) Prime Contractor Responsibilities -O
14) Subcontractor Responsibilities -O
15) Consultant Responsibilities -O
16) Management Approach -O

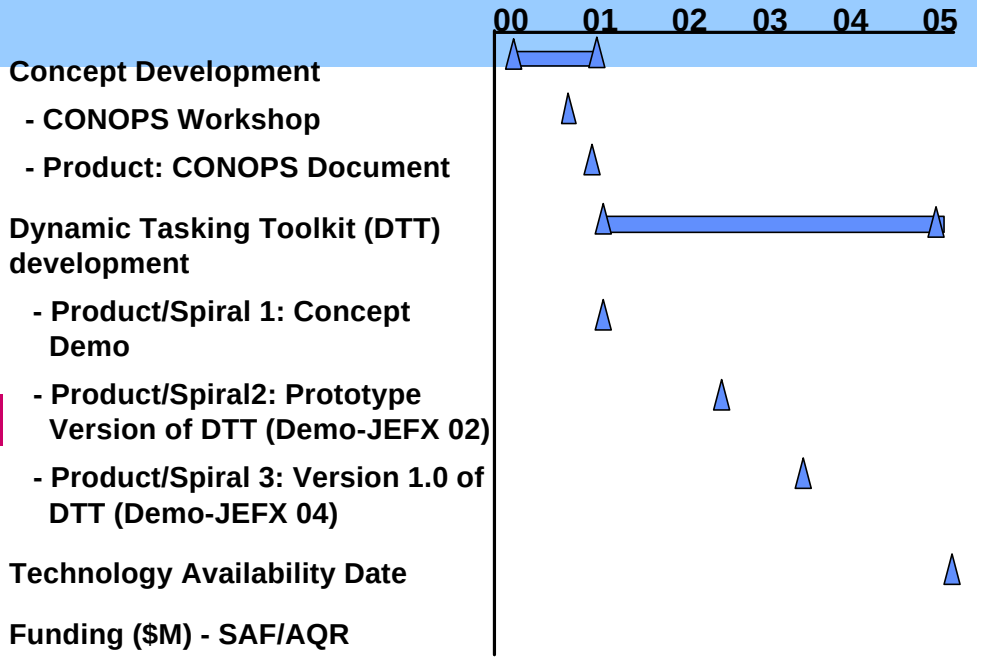
Agenda: 130 minutes Formal Presentation and break
45 minutes Caucus (Govt to prepare questions)
45 minutes Caucus (Offeror prepare answers to Govt questions)
60 minutes Question response period

Effects Based Operations

Vision: Dynamic Tasking Toolkit



Technology Investment Schedule



Description

Develop new concepts, tactics, and software tools to support an effects-based operations strategy.

Benefits to the War Fighter

- Comprehensive, Coherent and Integrated Joint Aerospace Operations Plan (JAOP) and Execution Order
- Dynamic Situation Assessment and Prediction
- Improve JFACC - Level Campaign Builder/Adjuster
- Improve Reactive Planning During the Mission
- Improve Reactive Force Reallocation During Mission Execution (JFACC)
- Improve Visibility and Timely Distribution of Resources
- Improve Situation Assessment and Course of Action (COA) Analysis
- Enables Predictive Command and Control

Conclusions

- Effects-Based Operations is developing new concepts, tactics, and tools to support an effects-based operations strategy.

- Expected Pay-offs and Products:
  - Efficient determination of effects-based campaign strategy
  - Automation support for developing both strategy and assessment plans
  - Focusing/leveraging ISR assets in campaign assessment (e.g. are we accomplishing objectives)
  - Enable predictive Command and Control
  - Integrating lethal/non-lethal methods in a common framework
  - Predict effects from behavior, provide rationale and compute enemy workarounds

- We have a Vision, We have a CONOPs, Now we have to make it Happen